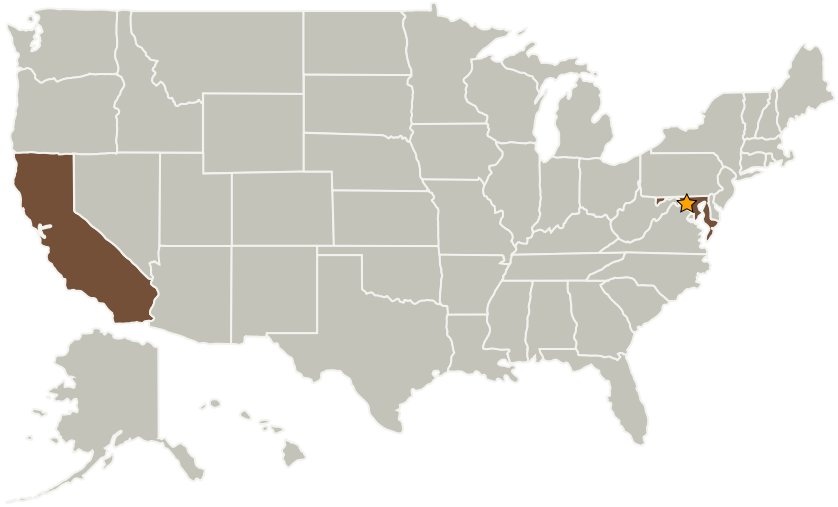
Silicon Microchannel Plate Large Area UV Detector, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

To address the NASA GSFC need for efficient UV photodetectors for NASA missions, such as the follow-on to FUV detectors of the Galaxy Evolution Explorer, Physical Optics Corporation (POC) proposes to develop a new Silicon Microchannel-Plate-Based Large-Area UV detector (UV-Si-MCP). It is based on a solar-blind, highly efficient GaN photocathode and POC's silicon microchannel plates (Si-MCPs). The high-quantum-efficiency, negative electron affinity GaN photocathodes will be fabricated directly on the entrance surface of the Si-MCP. This is possible because of the substrate's ability to withstand high temperatures and its compatibility with GaN application. This enables us to meet NASA requirements for a UV detector with high sensitivity, resolution, and reliability. The UV-Si-MCP offers high quantum efficiency (50%) and >10^9 channels, for better detection of faint objects with improved spatial and spectral resolution. In Phase I POC will demonstrate the feasibility of the UV-Si-MCP by fabricating and testing a preliminary prototype, exhibiting TRL-4. In Phase II POC will develop a fully functional (TRL-6) prototype with up to 10^9 readout channels and quantum efficiency up to 50%. The demonstrated results will offer NASA capabilities to improve our understanding of the origin of the universe and its evolution to modern form.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Physical Optics Corporation	Supporting Organization	Industry	Torrance, California

Primary U.S. Work Locations	
California	Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Michael Gertsenshteyn

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes